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New Data on Synecology of Vyazniki Terrestrial Community (Terminal Permian, Central Russia)

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Abstract—New materials from terminal Permian localities of the Vyazniki Faunal Assemblage from the eastern Vladimir Region, including a tooth of the proterosuchid *Archosaurus rossicus* Tatarinov, 1960, which is recorded for the first time in a coprolite, are described. New data on tetrapod coprolites allow a more reliable reconstruction of trophic relationships and reorganization of the trophic structure of this terrestrial community. Interactions of the higher-rank consumers therocephals and early proterosuchid archosaurs were not restricted to competition for food resources, but also included preying of adult representatives of one taxon on juveniles of the other.

Keywords: terrestrial tetrapod community, trophic structure, coprolites, terminal Permian, Permo-Triassic ecological crisis, Vladimir Region

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INTRODUCTION

At the Permian–Triassic boundary, there was the greatest global biotic crisis in the Earth's history. Mass extinction occurred both in the sea and on land and was accompanied by principal changes in the dominant groups and community structure. However, the ecological crisis on land has been examined very incomplete. To recognize its causes and developmental trends it is necessary to study the most complete, continuous sections of boundary continental beds of the Permian and Triassic, which are characterized by fossils from both underlying and overlying the boundary. This opportunity is provided by the sections in the central region of European Russia (Sennikov and Golubev, 2005, 2006a, 2006b, 2012; Newell et al., 2010; Golubev et al., 2012).

LATE PERMIAN AND EARLY TRIASSIC VERTEBRATE LOCALITIES OF THE VLADIMIR REGION

During the last several years, in the eastern Vladimir Region, including the vicinity of the towns of Gorokhovets and Vyazniki, several new faunal and floral localities have been discovered (Sennikov et al., 2003, 2009, 2014; Sennikov and Golubev, 2012, 2013). This enables us to trace in detail the replacement of particular dominant tetrapod groups and faunal assemblages in the series of Sokolki, Vyazniki, and Spasskoe assemblages (Ivakhnenko et al., 1997; Ivakhnenko, 2015) and continental communities (Sennikov, 1995, 1996; Ivakhnenko, 2001, 2011, 2015) at the Permian–Triassic boundary in this region.

The Gorokhovets locality of Late Permian vertebrates of the Sokolki Faunal Assemblage turned out to be the richest in the Permian with reference to faunal taxonomic diversity, with the prevalence of aquatic taxa, amphibians and fishes (Sennikov et al., 2003, 2014). Tetrapods are represented there by the brachiopoids labyrinthodonts, including the dvinosaurid *Dvinosaurus campbelli;* the kotlassiid seymouriamorphs are *Kotlassia prima, Microphon* cf. *arcanus,* the karpinskiosaurid *Karpinskiosaurus secundus;* pareiasaurs are Pareiasauridae gen. indet. and Elginiidae gen. indet.; the Chroniosuchia are the chroniosuchid *Chroniosuchus licharevi;* dicynodonts are Dicynodontinae gen. indet.; large gorgonopians are the gorgonopian *Inostrancevia* sp.; and small gorgonopians are Gorgonopidae gen. indet.; therocephals are the hofmeyriid *Gorochovetzia sennikovi;* and cynodonts are the procynosuchid *Procynosuchus vladimiriensis* (Sennikov et al., 2003, 2014; Ivakhnenko, 2011). The enclosing beds are a lenticular interbed of conglomerates with clayey, less often, sandstone, almost nonrounded pebble, which are replaced upward in the section by obliquely laminated sand with small gravelstone lenses. This locality is of the coastal–shoal genesis, formed as a result of mass extinction of aquatic vertebrates, which apparently resulted from drying of a pond during a droughty season and subse-